THE GERONTOLOGICAL SOCIETY OF AMERICA®

Journals of Gerontology: Social Sciences
cite as: *J Gerontol B Psychol Sci Soc Sci*, 2023, Vol. XX, No. XX, 1–15
https://doi.org/10.1093/geronb/gbac196
Advance Access publication December 20, 2022

OXFORD

Research Article

Intergenerational Ties and COVID-19 Contagion: A Study on European Adults Aged 50 Years and Older Using SHARE Data

Damiano Uccheddu, PhD* and Ester Lucia Rizzi, PhD**

University of Louvain (UCLouvain), Center for Demographic Research (DEMO), Louvain-la-Neuve, Belgium.

*Address correspondence to: Damiano Uccheddu, PhD, University of Louvain (UCLouvain), Center for Demographic Research (DEMO), Place Montesquieu 1 (L2.08.03), 1348, Louvain-la-Neuve, Belgium. E-mail: damiano.uccheddu@uclouvain.be

Received: March 24, 2022; Editorial Decision Date: December 13, 2022

Decision Editor: Jessica Kelley, PhD, FGSA

Abstract

Objectives: Intergenerational coresidence and interdependence among family members are salient forms of family support. However, they can also likely increase social and physical contact and thus potential coronavirus disease 2019 (COVID-19) transmission, especially among older adults. This study makes an original contribution to the literature by investigating which individual and household characteristics are associated with the risk of COVID-19 contagion among community-dwelling adults aged 50 years or older living in 27 European countries. We accounted for multiple indicators of intergenerational relationships and conducted a gendered analysis.

Methods: The data came from the Survey of Health, Ageing and Retirement in Europe (SHARE), including 2 waves of the SHARE Corona Survey. Using linear probability models, the risk of experiencing COVID-19 outcomes was predicted by different family structures and intergenerational relationship indicators.

Results: While intergenerational coresidence was not associated with the risk of COVID-19, a higher frequency of face-to-face contact with adult children was associated with a lower risk of COVID-19 among mothers. This result stresses the importance of social support from adult children during the COVID-19 pandemic. However, we also showed that grandparents who took care of grandchildren were at a higher risk of COVID-19. Additionally, childless individuals had a lower risk of COVID-19 during the second wave of the pandemic.

Discussion: This study highlights the importance of intergenerational relationships in pandemic studies and underscores the need to examine how intergenerational ties might be a source of social support. Implications for policy interventions are discussed in the final section.

Keywords: Coresidence, Family structure, Health outcomes, Intergenerational relations, Living arrangements

Family is a key social factor that shapes health outcomes at the individual and population levels (Umberson & Thomeer, 2020). The role of family structure and dynamics has become even more important since the outbreak of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Thomeer et al., 2020). Physical contact (skin-to-skin contact) and face-to-face meetings (personal conversations in the physical presence of others) are the main transmission modes of COVID-19 (Huang et al., 2020; Leung, 2021; Peeri et al., 2020). Within the household, individuals are more likely to contract COVID-19 when family members frequently leave the home (e.g., because of employment, study, leisure, or other social activities; Li et al., 2020; Yan et al., 2021). This is a concern that is immediately relevant to families with adult children who live at home, as they are more exposed to a

© The Author(s) 2022. Published by Oxford University Press on behalf of The Gerontological Society of America. All rights reserved.
For permissions, please e-mail: journals.permissions@oup.com.

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

wider social network outside the household, which could put their aging parents at risk for COVID-19 infection (Andrade et al., 2022; Bayer & Kuhn, 2020; Brandén et al., 2020; Dowd, Andriano, et al., 2020; Esteve et al., 2020; Stokes & Patterson, 2020). More generally, intergenerational family relations may favor COVID-19 among older adults as a consequence of frequent interactions and coresidence with adult children (Andrade et al., 2022; Bayer & Kuhn, 2020; Brandén et al., 2020; Dowd, Andriano, et al., 2020; Esteve et al., 2020; Stokes & Patterson, 2020).

Early studies used the share of multigenerational households in a country as a way to measure intergenerational family relationships and assess whether they were connected to COVID-19 outcomes. Some of these studies indicated a positive association between the percentage of adults living with their parents and COVID-19 mortality (e.g., Bayer & Kuhn, 2020; Esteve et al., 2020; Fenoll & Grossbard, 2020; Mogi & Spijker, 2021). However, intergenerational ties did not seem to be a determining factor in Europe (Arpino et al., 2020a; Fenoll & Grossbard, 2020) or in Italy, one of the major COVID-19 hotspots during the first wave of the pandemic (Arpino et al., 2020a; Basellini & Camarda, 2022; Liotta et al., 2020). Given the aggregate level of these analyses, the evidence is not clear-cut because it is difficult to control for potential confounders (Arpino et al., 2020a).

More recently, a smaller but growing body of literature has developed on individual-level data to disentangle the effects of intergenerational family relationships from those of other sources of confounding. Brazilians aged 60 years and older living in multigenerational households are more likely to test positive for COVID-19 but less likely to report symptoms of the disease (Andrade et al., 2022). These findings are net of individual background characteristics, such as education and health conditions, that correlate with susceptibility to COVID-19. Older adults aged 70 years and older living with someone of working age are more likely to die from COVID-19 in Stockholm County in Sweden (Brandén et al., 2020). Simulation models and empirical evidence on person-to-person contact patterns point to other social network characteristics as potential explanations, such as how many social network contacts individuals have (Fraser & Aldrich, 2021; Prem et al., 2020; Sage et al., 2021). These contradictions in findings may reflect differences in study design across countries, sample composition, methods, measures of health employed (e.g., how mortality and COVID-19 contagion are measured), as well as other factors (such as political, economic, social, and cultural). In addition, gender differences are rarely taken into account when considering the influence of intergenerational ties and COVID-19.

This study makes a unique contribution to the literature on intergenerational family relationships and COVID-19 by analyzing microlevel data from 27 European countries participating in the Survey of Health, Ageing and Retirement in Europe (SHARE; Scherpenzeel et al., 2020). For the same individuals, data were collected during the first (June–August 2020) and second outbreaks of COVID-19 in Europe (June–August 2021). Other distinctive contributions of this study are the focus on multiple indicators of intergenerational relationships (i.e., intergenerational coresidence, network-exposure severity to COVID-19 among family and nonfamily members, intergenerational face-to-face contact frequency, and provision of grandchild care), together with a detailed analysis focused on gender.

Intergenerational Relationships and COVID-19

Intergenerational relationships are crucial in later life, as they might be the main source of family support for older adults (for a review, see Dykstra et al., 2014). However, during the pandemic, they could also be the causes of COVID-19 infection (e.g., Stokes & Patterson, 2020).

There are at least two ways in which intergenerational relationships can influence the risk of COVID-19 infection among older adults. On the one hand, intergenerational relationships can be *positively* associated with the risk of COVID-19 contagion. An emerging hypothesis in the literature about family and COVID-19 is the "intergenerational contact hypothesis" (ICH), which assumes that in countries where ties between generations are stronger, the risk of COVID-19 outcomes is also stronger (Arpino et al., 2020a, 2020b; Dowd, Andriano, et al., 2020; Dowd, Block, et al., 2020). This hypothesis suggests that intergenerational coresidence and interactions may accelerate the transmission of SARS-CoV-2 through social networks that increase the proximity of older adults to initial cases (Dowd, Andriano, et al., 2020). Research on this topic is still limited, and the findings are not conclusive (Arpino et al., 2020a, 2020b; Liotta et al., 2020; Sage et al., 2021). For example, a higher prevalence of intergenerational coresidence and contacts in Europe is positively associated with COVID-19 case fatality rates at the country level and negatively correlated with the same outcome at the subnational level (Arpino et al., 2020a). Other evidence in support of the ICH has been provided with aggregated data at the country level (Bayer & Kuhn, 2020) and individual-level data from Stockholm County in Sweden (Brandén et al., 2020). The latter study shows that being exposed to working-age family members is related to increased COVID-19 mortality among older adults. Similarly, a recent study based on a sample of individuals aged 60 years and older living in Brazil suggests that those living with younger family members are more likely to test positive for COVID-19 than those living alone (Andrade et al., 2022).

On the other hand, intergenerational relationships can be *negatively* associated with the risk of COVID-19 and may be a source of protection for older adults. Social network theory suggests that the interpersonal environment in which people are embedded is a key determinant of their health outcomes (Thoits, 2011; Zhang & Centola, 2019). Even more so during old age, intergenerational

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

relationships are a source of social support and therefore can be crucial for individual health and well-being (Dykstra et al., 2014). In line with this argument, adult children can protect their older parents from the risk of COVID-19 contagion (Arpino et al., 2020a, 2020b). For example, children can help their parents avoid unhealthy behaviors (Umberson et al., 2010), and they can encourage them to respect the rules imposed by the government (e.g., quarantines, lockdowns, curfews). Adult children can also help older parents with the daily activities that are accomplished outside the home, such as grocery shopping, running errands, and accessing health care (Arpino et al., 2020a, 2020b). These aspects suggest that the risk of COVID-19 infection could be particularly high for both childless older adults and people living without a partner, as they are more likely to participate in activities outside of the household. In addition, it has been shown that childless individuals have lower adherence to social distancing protocols and hygienic behavior recommendations (Ebrahimi et al., 2021).

Gender and COVID-19 Contagion

At the global level, data show that men and women contract COVID-19 at similar rates (Global Health 5050, 2022), although men tend to have worse outcomes than women. These include differences in the characteristics of the disease (e.g., infectivity and severity) and the related outcomes, such as hospitalization, intensive care unit admissions, and mortality (Ahrenfeldt et al., 2021; Gebhard et al., 2020; Global Health 5050, 2022; Lakbar et al., 2020). However, disentangling the gender differences by age, Sobotka and colleagues (2020) show that women of working age had higher infection rates than men during the first wave of the COVID-19 pandemic. This pattern reversed around retirement, at age 60–69, with men experiencing higher levels of infection than women. This reversal gap is because female employment is largely concentrated in sectors that have been most affected by the pandemic, such as personal care and health services, child daycare, and similar occupations (Sobotka et al., 2020).

Despite women's advantage after retirement, there could still be a higher risk of COVID-19 infection for women compared to men due to women's more frequent contact and care of family members (Thomeer et al., 2020; Umberson & Thomeer, 2020). Family responsibilities, including informal care and kin-keeping roles, have traditionally been constructed and negotiated as a female prerogative (Brown & DeRycke, 2010; Connidis & Barnett, 2018). Although studies in several national contexts illustrate a reorganization of the gender division of labor during the COVID-19 pandemic, the division of unpaid labor remains gender unequal (Leap et al., 2022). At older ages, it has been shown that women's kin-keeper role compared to that of men has even increased, particularly regarding face-to-face contact with children (Vergauwen et al., 2022).

However, if women can be at a greater risk of contracting COVID-19 due to their stronger embeddedness in their family networks, they may also be more protected than men by those same family ties. For example, because women are more likely to go grocery shopping (Flagg et al., 2014), practical help from adult children in this activity during the pandemic could have been especially beneficial for them. Given these considerations, we assume that the consequences of intergenerational ties on COVID-19 outcomes should be divided along gender lines.

Hypotheses

In line with the ICH, we evaluated the hypotheses that parents should be at higher risk of COVID-19 than childless individuals (Hypothesis 1a) and that parents with at least one coresident adult child should be at higher risk of COVID-19 than parents who do not live with their children (Hypothesis 2a). Drawing on the literature on social support at older ages (Dykstra et al., 2014), competing hypotheses can be formulated. As children are also a crucial source of social and emotional support for their aging parents, we can expect parents who do not live with their children (Hypothesis 1b) and parents with a coresident child to be at lower risk of COVID-19 (Hypothesis 2b) than childless individuals. Continuing along the same line of reasoning, we should expect that for frequent face-to-face contact with nonresident adult children, the risk of COVID-19 among older parents should be high (Hypothesis 3a). Alternatively, we should expect that for a high frequency of face-to-face contact with nonresident adult children, the risk of COVID-19 among older parents should be low (Hypothesis 3b). Because the ICH assumes that contacts between generations are at the root of the spread of the virus among the older population, we hypothesize that exposure to COVID-19 among children should be more positively associated with older parents' COVID-19 contagion than exposure to COVID-19 among other family members, friends, neighbors, or other persons (Hypothesis 4). Accounting for exposure to COVID-19 among children will also allow interpreting face-to-face contact with children as a support resource rather than a mere risk factor that could increase parents' chances of contracting the SARS-CoV-2 virus. Finally, we hypothesize that those who care for grandchildren are at a higher risk of COVID-19 than those who do not have grandchildren or those who do not provide care for grandchildren (Hypothesis 5).

Data and Methods

Data

In this study, we used data from the eighth wave of SHARE (fielded in October 2019–March 2020) combined with the two waves of the SHARE Corona Survey (SCS) administered in the summers of 2020 and 2021. SHARE is a

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

longitudinal survey of approximately 140,000 individuals aged 50 years or older and covering 27 European countries and Israel (Börsch-Supan et al., 2013). The topics covered by the survey are health, well-being, socioeconomic status, and social and family networks. To date, SHARE consists of nine study waves, including two waves of a special COVID-19 survey (SCS) that were collected between June and August 2020 (SCS1) and June and August 2021 (SCS2) (Scherpenzeel et al., 2020). The SCS questionnaire covers the most important life domains and asks specific questions about infections and changes in life before and after the COVID-19 outbreak. While regular SHARE waves are usually conducted face-to-face (computer-assisted personal interview), in the SCS, interviewers use the telephone (computer-assisted telephone interview [CATI]; Scherpenzeel et al., 2020).

Of the 46,733 SHARE respondents participating in the regular SHARE Wave 8, it was possible to match 33,506 (71.7%) of those who also participated in both SCS1 and SCS2. Our sample consisted of 27 countries in Europe (namely, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland). Portugal was excluded from the analyses because it participated in SCS1 only. In this study, we used only records of individuals who met the original SHARE sample criteria, i.e., 50 years of age or older (404 observations removed). We further restricted the analytical sample by excluding individuals with missing information on the dependent variable (1,393 observations deleted), intergenerational coresidence (16,154 observations deleted), or other covariates of interest (3,205 observations deleted). Thus, the final analytic sample was composed of 65,054 respondents (see Table 1 for descriptive information).

Measures

Dependent variable: COVID-19

COVID-19 contagion served as our dependent variable for this study. Respondents were asked the following three questions: (1) "Since the outbreak of Corona, did you or anyone close to you experience symptoms that you would attribute to the Covid illness, e.g., cough, fever, or difficulty breathing?"; (2) "Have you or anyone close to you been tested for the Corona virus and the result was positive, meaning that the person had the Covid disease?"; and (3) "Have you or anyone close to you been hospitalized due to an infection from the Corona virus?" If the respondent answered "yes" to these questions, then he or she was asked the following: "Who was it? Please tell me their relationship to you." In our study, respondents who experienced symptoms compatible with COVID-19, tested positive for COVID-19, or were hospitalized because of COVID-19 were coded as 1; otherwise, they were coded as 0. This variable is contained in both the SCS1 and SCS2. However, the time reference in the wording of the question is different (i.e., "Since the outbreak of Corona" in SCS1, and "Since your last interview" in SCS2). The questionnaires of the SCS are available at http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-1.html and http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-2.html.

Independent variables

Intergenerational coresidence.—Our analysis concerned childless individuals and parents, and with regard to the latter, we identified intergenerational coresidence from a question about parent–child geographical proximity. In two-parent households, one of the two parents (i.e., the "household respondent") answered questions about the children's characteristics on behalf of both parents. The variable was set equal to 0 when a parent reported having no child living in the home and equal to 1 for parents with at least one coresident child. Because we were interested in retaining both parents and nonparents, we set the variable equal to 2 for childless individuals. This variable is measured in the regular SHARE Wave 8. The SHARE questionnaire is available at http://www.share-project.org/data-documentation/questionnaires/questionnaire-wave-8.html.

Intergenerational contacts.— The frequency of face-to-face contact between parents and children was measured by responses to the following question: "Since the outbreak of Corona, how often did you have personal contact, that is, face to face, with [your own children] from outside your home? Was it daily, several times a week, about once a week, less often, or never?" We used the answers to this question to create the following categories: 0 = "Never," 1 = "Less than once a week," 2 = "About once a week," 3 = "Several times a week," and 4 = "Daily." Thus, the reference category included those respondents who had no contact with children outside the household, irrespective of whether they had children. This variable is contained in both the SCS1 and SCS2.

Network-exposure severity.—Our analysis aimed at accuracy in terms of who was exposed to COVID-19 within family and nonfamily social networks, as well as how severe this exposure was. Network exposure is defined as knowing someone who has had any level of COVID-related outcomes, and it was asked in the SCS relative to nine relationship categories: (1) respondent; (2) spouse or partner; (3) parent; (4) child; (5) other household members; (6) other relatives outside the household; (7) neighbors, friends, or colleagues; (8) caregivers; and (9) others. For each relationship category, respondents were asked how many people in the network (a) experienced COVID-19 symptoms (cough, fever, or difficulty breathing); (b) tested positive for COVID-19; (c) tested negative for COVID-19; (d) were hospitalized due to COVID-19; and (e) died due to COVID-19. As we were interested in accounting for the severity of network exposure, we attributed one point for

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

Table 1. Description of the Variables Used in the Analyses, by Survey Wave

	SHARE Corona Survey 1 (SCS1)					SHARE Corona Survey 2 (SCS2)				
	Freq.	% (mean)	*SD*	Min.	Max.	Freq.	% (mean)	*SD*	Min.	Max.
COVID-19 contagion										
No	33,861	98.0				27,951	91.6			
Yes	690	2.0				2,552	8.4			
Gender										
Men	14,433	41.8				12,593	41.3			
Women	20,118	58.2				17,910	58.7			
Intergenerational coresidence										
No child(ren) coresiding	25,701	74.4				22,574	74.0			
At least one child coresiding	5,884	17.0				5,401	17.7			
Childless	2,966	8.6				2,528	8.3			
Face-to-face contact frequency with children										
Never	5,197	15.0				1,490	4.9			
Less than once a week	9,978	28.9				7,028	23.0			
About once a week	5,520	16.0				6,539	21.4			
Several times a week	4,809	13.9				6,405	21.0			
Daily	6,081	17.6				6,513	21.4			
Childless	2,966	8.6				2,528	8.3			
Number of grandchildren										
0	8,208	23.8				7,467	24.5			
1	3,894	11.3				3,480	11.4			
2	5,673	16.4				4,966	16.3			
3+	16,776	48.6				14,590	47.8			
Grandchild care										
Grandchildless	8,208	23.8				7,467	24.5			
No grandchild care provided	15,337	44.4				13,153	43.1			
Nonintensive grandchild care	9,215	26.7				8,206	26.9			
Intensive grandchild care	1,791	5.2				1,677	5.5			
Living with a partner or spouse										
No	10,902	31.6				9,785	32.1			
Yes	23,649	68.5				20,718	67.9			
Age										
50–59	4,474	13.0				2,847	9.3			
60–69	12,713	36.8				10,927	35.8			
70–79	11,450	33.1				10,908	35.8			
80+	5,914	17.1				5,821	19.1			
Level of education										
Low	11,231	32.5				9,705	31.8			
Mid	15,298	44.3				13,692	44.9			
High	8,022	23.2				7,106	23.3			
Work situation										
Not working	27,996	81.0				25,859	84.8			
Worked at home only	1,096	3.2				711	2.3			
Worked at the usual work place	3,436	9.9				3,236	10.6			
Worked from home and at the usual work place	896	2.6				599	2.0			
Worked elsewhere, at a different work place	1,127	3.3				98	0.3			
ADL limitations										
No ADL limitations	30,629	88.7				27,427	89.9			
1+ ADL limitations	3,922	11.4				3,076	10.1			
IADL limitations										
No IADL limitations	28,026	81.1				25,301	83.0			
1+ IADL limitations	6,525	18.9				5,202	17.1			

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

Table 1. Continued

	SHARE Corona Survey 1 (SCS1)					SHARE Corona Survey 2 (SCS2)				
	Freq.	% (mean)	*SD*	Min.	Max.	Freq.	% (mean)	*SD*	Min.	Max.
Country										
Austria	1,281	3.7				1,141	3.7			
Germany	2,303	6.7				1,670	5.5			
Sweden	1,102	3.2				795	2.6			
Netherlands	478	1.4				436	1.4			
Spain	1,039	3.0				915	3.0			
Italy	1,820	5.3				1,666	5.5			
France	1,690	4.9				1,505	4.9			
Denmark	1,446	4.2				1,154	3.8			
Greece	2,691	7.8				2,483	8.1			
Switzerland	1,628	4.7				1,515	5.0			
Belgium	1,634	4.7				1,494	4.9			
Israel	641	1.9				525	1.7			
Czech Republic	1,963	5.7				1,566	5.1			
Poland	1,658	4.8				1,522	5.0			
Luxembourg	704	2.0				646	2.1			
Hungary	494	1.4				430	1.4			
Slovenia	2,040	5.9				1,930	6.3			
Estonia	2,628	7.6				2,371	7.8			
Croatia	1,047	3.0				1,011	3.3			
Lithuania	1,085	3.1				1,013	3.3			
Bulgaria	657	1.9				533	1.8			
Cyprus	363	1.1				295	1.0			
Finland	973	2.8				860	2.8			
Latvia	637	1.8				605	2.0			
Malta	654	1.9				589	1.9			
Romania	1,094	3.2				1,054	3.5			
Slovakia	801	2.3				779	2.6			
Network-exposure severity										
Children	34,551	0.0	1.0	-0.1	23.0	30,503	0.0	1.0	-0.4	9.0
Spouse	34,551	0.0	0.9	-0.1	37.0	30,503	0.0	1.0	-0.2	10.7
Parent	34,551	0.0	0.9	0.0	38.5	30,503	0.0	1.0	-0.1	25.3
Other HH members	34,551	0.0	1.0	-0.1	45.0	30,503	0.0	1.0	-0.1	19.8
Other relatives (outside HH)	34,551	0.0	1.0	-0.2	13.3	30,503	0.0	1.0	-0.5	5.1
Other-network (no relatives)	34,551	0.0	0.9	-0.2	15.0	30,503	0.0	1.0	-0.4	9.4

Notes: ADL = activities of daily living; HH = household; IADL = instrumental activities of daily living; SHARE = Survey of Health, Ageing and Retirement in Europe.
Unless otherwise indicated, values are reported in percentages. Unweighted pooled data set (N = 65,054).
Source: SHARE Wave 8 (2019–2020), SHARE Corona Survey 1 (June–August 2020) and 2 (June–August 2021).

experiencing COVID-19 symptoms, two points for positive test results, five points for hospitalizations, and 10 points for deaths. Scores on each exposure were multiplied by the number of persons cited in each relationship category and then summed in an additive index. A large part of the sample reported having had no exposure whatsoever (71.19%). Additionally, the frequency distributions were strongly skewed to the right. Therefore, we capped the score scale for each category at 10 points.

Thus, we obtained six specific network exposure severity variables, each considering six different key relationships: the variable "Children-exposure severity" was based on the abovementioned relationship category 4, the variable "Spouse" was based on category 2, the variable "Parent" on category 3, "Other household (HH) members" on category 5, "Other relatives (outside HH)" on category 6, and the variable "Other-network (no relatives)" was based on the relationship categories 7–9. A similar counting approach to operationalize this network property is also used in surveys such as SHARE, the Health and Retirement Study, the English Longitudinal Study of Ageing (Litwin & Levinsky, 2021), and the Lubben Social Network Scale

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

(Lubben et al., 2006). This variable is measured in both the SCS1 and SCS2.

Grandchild care.—Our study accounted for two additional indicators of intergenerational relations: the number of grandchildren (0, 1, 2, 3, 4+) and the provision of grandchild care. Information on grandchild care in the regular SHARE wave 8 was obtained through a question asking: "During the last twelve months, have you regularly or occasionally looked after [your grandchild/your grandchildren] without the presence of the parents?" Those who said they looked after their grandchildren were asked how often they did so on average. The answer categories were "about daily," "about every week," "about every month," and "less often." Using this information, we distinguished respondents into four groups based on their level of involvement in grandparental childcare: those without grandchildren; those who did not look after grandchildren; those who provided intensive grandparental childcare (i.e., looked after at least one grandchild "about daily"); and those who provided nonintensive grandchild care (defined as looking after a grandchild approximately every week, once a month, or less often). This variable is contained in the regular SHARE wave 8.

Control variables

Sociodemographic confounders included gender (0 = men, 1 = women), age categories ("50–59," "60–69," "70–79," "80+"), level of education, based on the International Standard Classification of Education (ISCED) 1997 (low = ISCED 0, 1, and 2; medium = ISCED 3 and 4; high = ISCED 5 and 6), and living with a partner or spouse (0 = no, 1 = yes). Because the type of occupation and the characteristics of the workplace could be an important driver of COVID-19 contagion (Anand et al., 2022), we accounted for the work situation during the pandemic ("Not working," "Worked at home only," "Worked at the usual work place," "Worked from home and at the usual work place," and "Worked elsewhere, at a different work place"). Our analyses also accounted for the number of limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs) as measures of functional ability. ADLs and IADLs were self-reported scores of current functional limitations recorded over a period of more than 3 months. The ADL measure consisted of six activities: dressing (including shoes and socks); walking across a room; bathing or showering; eating and cutting up food; getting in or out of bed; and using the toilet (including getting up and down). The IADL measure covered nine instrumental activities: telephone calls; taking medications; doing work around the house or garden; managing money; leaving (or accessing) the house independently; doing personal laundry; using a map in a strange place; preparing a hot meal; and shopping for groceries.

In addition to these sociodemographic variables, we also controlled for country dummy variables. This allowed for country-level factors to be taken into account, such as the specific stage of the pandemic's development or the public policy measures against COVID-19. Finally, we included a control for the time between interview waves, as the length of time between the regular SHARE wave 8 and the first and the first and second waves of the SCS varied across respondents and countries. While some control variables were assessed at each wave (i.e., gender, age, education, and living with a spouse), others were measured only in the regular SHARE wave 8 (i.e., limitations in ADLs and IADLs) or in both the SCS1 and SCS2 only (i.e., work situation).

Analytic Strategy

We used linear probability models (LPMs) to estimate the association between intergenerational relationships and COVID-19 transmission. The advantage of using LPMs is that they offer a relatively straightforward interpretation of the estimates and the possibility of comparing the coefficients across different models (Mood, 2010). In the first step of the analysis, we estimated the total effects of family structure, that is, being childless or a parent, intergenerational coresidence, and the presence of a partner/spouse in the household (Model 1). Then, we were interested in the influence that the presence of COVID-19 in one's social network had on one's COVID-19 risk. Hence, we separately added the six indicators for network exposure severity (Model 2). Including these variables made it possible to interpret intergenerational relationships net of COVID-19 contagions in one's social network and thus, for example, to interpret face-to-face contact with one's children as a resource of social support instead of considering it solely as a risk factor for COVID-19. In the second step of the analysis, we were interested in expanding to other dimensions of intergenerational relations. To do so, we introduced more diverse indicators of intergenerational relationships to account for their influence on the risk of COVID-19 infection. Thus, in the subsequent models, we separately added the indicators of intergenerational (face-to-face) contact between parents and children from outside the household (Model 3), grandparenthood status (Model 4), and the provision of grandchild care (Model 5). As the wording of the questions was formulated differently in SCS1 and SCS2, we estimated the models separately by SCS wave. In addition, all models were estimated separately for men and women and included robust standard errors. Data were analyzed using Stata 17.

Results

Table 1 presents univariate descriptions of the study variables. Among the SCS participants, COVID-19 transmission was 2.00% in SCS1 (1.94% for men, 2.04% for women) and 8.37% in SCS2 (8.17% for men, 8.50% for women). The percentage of those who coresided with their adult children was 17.35% (14.80% for men and 19.15% for women).

Table 2 shows the results of multivariable linear probability models examining the relationships between family

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

Table 2. Linear Probability Models: Association of Intergenerational Relationships with COVID-19 Contagion, SHARE Corona Survey 1 (SCS1)

	Men				Women			
	Model 1		Model 2		Model 1		Model 2	
	b	95% CIs	*b*	95% CIs	*b*	95% CIs	*b*	95% CIs
Family structure								
Intergenerational coresidence (ref: No coresiding children)								
At least one child coresiding	0.000	−0.006–0.006	−0.001	−0.007–0.005	−0.001	−0.006–0.004	−0.001	−0.006–0.003
Childless	−0.005	−0.013–0.003	−0.002	−0.010–0.005	−0.004	−0.011–0.003	−0.003	−0.010–0.004
Partner in household (ref.: No)								
Yes	−0.005	−0.012–0.001	−0.007*	−0.013 to −0.000	−0.002	−0.006–0.002	−0.005*	−0.009 to −0.001
Network-exposure severity								
Children			0.003	−0.001–0.007			0.008***	0.005–0.012
Spouse			0.038***	0.030–0.046			0.031***	0.021–0.040
Parent			0.000	−0.004–0.005			0.002	−0.002–0.006
Other HH members			0.003	−0.004–0.009			0.002	−0.001–0.005
Other relatives (outside HH)			0.002	−0.001–0.005			0.001	−0.001–0.004
Other-network (no relatives)			0.004*	0.001–0.008			0.007***	0.003–0.010
Control variables	Yes		Yes		Yes		Yes	
Constant	0.030**	0.012–0.048	0.031***	0.013–0.049	0.024***	0.011–0.037	0.023***	0.011–0.036
Observations	14,433		14,433		20,118		20,118	
R-squared	0.015		0.088		0.013		0.058	

Notes: CI = confidence interval; COVID-19 = coronavirus disease 2019; HH = household; SHARE = Survey of Health, Ageing and Retirement in Europe; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
The outcome variable is defined as reporting symptoms compatible with COVID-19, positive tests for COVID-19, or hospitalization due to COVID-19. Models include all control variables. Full model estimates are presented in Supplementary Tables A1 and A2.
Source: SHARE Wave 8 (2019–2020), SHARE Corona Survey 1 (June–August 2020) (own estimates).

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

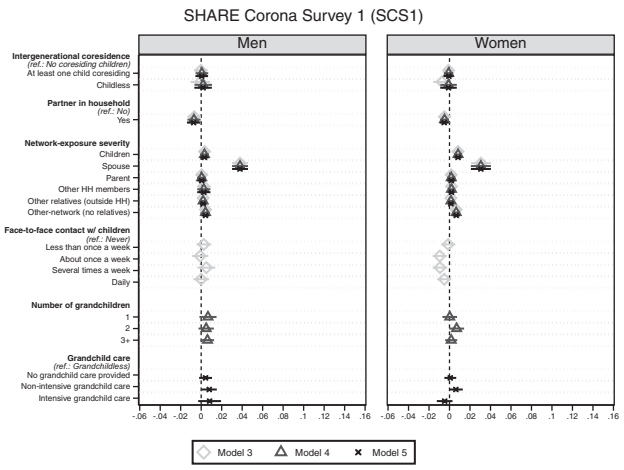

Figure 1. Linear probability models: Association of intergenerational relationships with COVID-19 contagion. *Source:* SHARE Wave 8 (2019–2020), SHARE Corona Survey 1 (June–August 2020) (own estimates). *Note:* The outcome variable is defined as reporting symptoms compatible with COVID-19, positive tests for COVID-19, or hospitalization due to COVID-19. Model 3 adds the frequency of contact between parent and non-coresident child (i.e., "Face-to-face contact with children"); Model 4 includes the number of grandchildren; and Model 5 includes a measure of grandchild care. All regression models include all control variables. Full model estimates are presented in Supplementary Tables A1 and A2. COVID-19 = coronavirus disease 2019; HH = household; SHARE = Survey of Health, Ageing and Retirement in Europe.

structure and COVID-19 outcomes for both men and women in the first wave of the pandemic (SCS1). Full model estimates are presented in Supplementary Tables A1 and A2. Model 1 indicated that there were no statistically significant differences between having or not having coresiding children and the risk of COVID-19 for men and women. Similarly, there were no statistically significant differences between childless individuals and parents in the risk of contracting COVID-19.

Model 2 added six items of network-exposure severity, and it was used to investigate the association between respondents' risk of COVID-19 and exposure severity to COVID-19 among family members, relatives, and acquaintances. The results indicated that network exposure severity among children (either coresiding or not) was positively associated with COVID-19 among women (Table 2, Model 2, b = 0.008; 95% confidence interval [CIs]: 0.005, 0.012; p < .001). More precisely, a 1 *SD* increase in exposure to COVID-19 among adult children was associated with a 0.008 percentage point increase in the probability of contracting COVID-19. This was associated with 800 more infections per 100,000 women. However, infections between spouses had a relatively higher impact on the risk of COVID-19 for both men (Table 2, Model 2; b = 0.038; 95% CIs: 0.030, 0.046; p < .001) and women (Table 2, Model 2; b = 0.031; 95% CIs: 0.021, 0.040; p < .001). Therefore, the risk of COVID-19 contagion when one had a child with COVID-19 was more than three times lower than the risk of having an infected spouse. For men, a series of Wald tests for equality of two coefficients confirmed that there were statistically significant differences between high levels of exposure to COVID-19 from spouses and other persons in the social network (e.g., children, other relatives, etc.). In the case of women, the effect of children's exposure severity was not statistically significantly different from the effect of COVID-19 exposure severity among other persons in the social network (excluding relatives).

Figure 1 shows the third and subsequent regression models for the first SHARE Corona Survey (SCS1). Model 3 added the face-to-face contact frequency with own children since the outbreak and showed that there were no statistically significant associations between this variable and the risk of COVID-19 among men (Figure 1). In the case of women, the variable was associated with a lower risk of COVID-19 infection. For example, having contact with one's own children approximately once a week was associated with a 1 percentage point decrease in the probability of contracting COVID-19 (Figure 1, Model 3, b = –0.009; 95% CIs: –0.017, –0.002; p < .01). This corresponded to approximately 100 fewer infections per 100,000 women.

Model 4 from Figure 1 shows that the number of grandchildren is not associated with the COVID-19 outcome. However, once we accounted for the provision of care for grandchildren, we observed that men who provided nonintensive care for a grandchild had a higher risk of contracting COVID-19 than individuals who did not have grandchildren (Figure 1, Model 5, b = 0.008; 95% CIs: 0.001, 0.015; p < .05).

Table 3 and Figure 2 present the results of the multivariable analysis of the second wave of the COVID-19 pandemic in Europe (SCS2). Full model estimates are displayed in Supplementary Tables A3 and A4. The results are largely in line with what was observed during the first wave of the pandemic (SCS1). For example, there was a positive association between exposure to COVID-19 among spouses and the risk of COVID-19 for both men (Table 3, Model 2; b = 0.138; 95% CIs: 0.127, 0.148; p < .001) and women (Table 3, Model 2; b = 0.115; 95% CIs: 0.105, 0.124; p < .001). An exception to the patterns observed in Table 2 is that being childless was associated with a lower risk of COVID-19 for men (Table 3, Model 1; b = –0.042; 95% CIs: –0.056, –0.028; p < .001). One result that remained consistent throughout the SCS waves and is worth noting is that older adults who had a partner in their household were at a lower risk of contracting COVID-19, net of the exposure to COVID-19 of members of the social network. For brevity, we did not comment on the results of the control variables. However, a more extensive commentary on the results of the control variables is provided in the Supplementary Appendix, together with additional robustness checks.

Discussion and Conclusion

This study aimed to investigate the complex role of intergenerational family relations on the spread of COVID-19

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

Table 3. Linear Probability Models: Association of Intergenerational Relationships with COVID-19 Contagion, SHARE Corona Survey 2 (SCS2)

	Men				Women			
	Model 1		Model 2		Model 1		Model 2	
	b	95% CIs	*b*	95% CIs	*b*	95% CIs	*b*	95% CIs
Family structure								
Intergenerational coresidence (ref: No coresiding children)								
At least one child coresiding	0.002	−0.012–0.016	0.004	−0.009–0.016	0.004	−0.007–0.015	0.007	−0.003–0.017
Childless	−0.042***	−0.056 to −0.028	−0.017**	−0.029 to −0.004	−0.014*	−0.027 to −0.000	0.009	−0.004–0.022
Partner in household (ref.: No)								
Yes	−0.003	−0.015–0.009	−0.022***	−0.035 to −0.010	0.003	−0.006–0.012	−0.021***	−0.030 to −0.013
Network-exposure severity								
Children			0.019***	0.013–0.025			0.031***	0.026–0.037
Spouse			0.138***	0.127–0.148			0.115***	0.105–0.124
Parent			0.009**	0.003–0.015			0.006*	0.000–0.011
Other HH members			0.013***	0.006–0.019			0.012***	0.006–0.017
Other relatives (outside HH)			0.004	−0.001–0.008			0.006**	0.002–0.010
Other-network (no relatives)			0.006**	0.002–0.011			0.006**	0.002–0.011
Control variables	Yes		Yes		Yes		Yes	
Constant	0.065***	0.030–0.100	0.079***	0.049–0.109	0.081***	0.054–0.108	0.097***	0.072–0.121
Observations	12,593		12,593		17,910		17,910	
R-squared	0.028		0.299		0.031		0.220	

Notes: CI = confidence interval; COVID-19 = coronavirus disease 2019; HH = household; SHARE = Survey of Health, Ageing and Retirement in Europe; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
The outcome variable is defined as reporting symptoms compatible with COVID-19, positive tests for COVID-19, or hospitalization due to COVID-19. Models include all control variables. Full model estimates are displayed in Supplementary Tables A3 and A4.
Source: SHARE Wave 8 (2019–2020), SHARE Corona Survey 2 (June–August 2021) (own estimates).

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

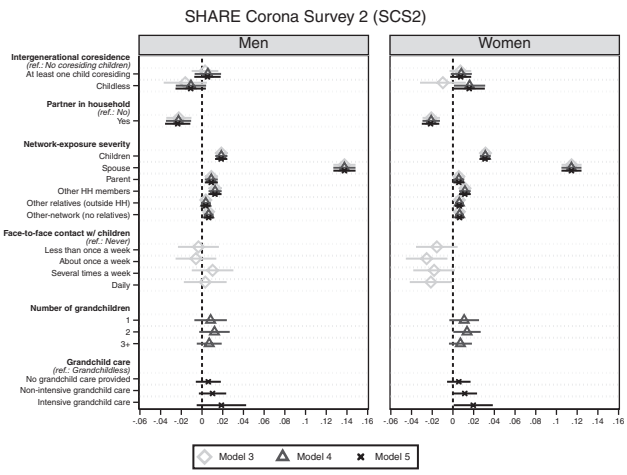

Figure 2. Linear probability models: Association of intergenerational relationships with COVID-19 contagion. *Source:* SHARE Wave 8 (2019–2020), SHARE Corona Survey 2 (June–August 2021) (own estimates). *Note:* The outcome variable is defined as reporting symptoms compatible with COVID-19, positive tests for COVID-19, or hospitalization due to COVID-19. Model 3 adds the frequency of contact between parent and non-coresident child (i.e., "Face-to-face contact with children"); Model 4 includes the number of grandchildren; and Model 5 includes a measure of grandchild care. All regression models include all control variables. Full model estimates are displayed in Supplementary Tables A3 and A4. COVID-19 = coronavirus disease 2019; HH = household; SHARE = Survey of Health, Ageing and Retirement in Europe.

among older adults in Europe. For this purpose, we drew upon aspects of the ICH (for a critical discussion, see Arpino et al., 2020a) and concepts from the domain of social networks (Thoits, 2011; Zhang & Centola, 2019). By analyzing individual-level data from two rounds of the SHARE Corona Survey (June–August 2020 and June–August 2021), we assessed whether specific intergenerational relationship indicators (i.e., being a parent, living with children, frequency of face-to-face contact with children, severity of exposure to COVID-19 from children, being a grandparent, and providing grandchild care) were associated with the risk of COVID-19 infection, controlling for the effects of sociodemographic background and other individual-level characteristics.

The first hypotheses in the present study were that parents are more at risk of COVID-19 than nonparents (Hypotheses 1a and 1b). Contrary to the theoretical expectations of the ICH, our results indicated that during the first wave of the pandemic, there was no substantive difference between parents and childless individuals in the risk of contracting COVID-19. However, concerning the second wave of COVID-19 in Europe, our results corroborated the hypothesis that childless people had a lower risk of contracting COVID-19 (Hypothesis 1a). In addition, our results were in contrast with the assumptions that intergenerational coresidence was associated with an increased risk of COVID-19 for parents, showing neither a higher risk (in contrast with Hypothesis 2a) nor a lower risk of COVID-19 (in contrast with Hypothesis 2b). Similarly, our results indicated that for men, the frequency of face-to-face contact with adult children living outside the parental home was not associated with a higher risk of COVID-19 (Hypothesis 3a). In contrast, among mothers, contact with children from outside the home was negatively associated with the risk of COVID-19, corroborating the hypothesis that a higher frequency of face-to-face contact with adult children is associated with a lower risk of COVID-19 (Hypothesis 3b), although no difference was observed for fathers. Importantly, these results persist net of the network-exposure severity to COVID-19 among family and non-family members. These findings provide the first individual-level indication of how important social support from children could be for the health of aging parents in the context of the COVID-19 pandemic (Arpino et al., 2020a, 2020b; Dykstra et al., 2014; Umberson et al., 2010). This substantiates the idea that children might be interested in keeping their parents in good health, and to achieve this goal, they exert pressure and control to inhibit their unhealthy behaviors (e.g., frequenting crowded places) and promote their positive habits (e.g., use of masks, self-isolation; Arpino et al., 2020a; Umberson et al., 2010). All in all, these findings are in line with the idea that adult children might be an important source of support for their aging parents, which in turn can lead to better health conditions during the COVID-19 pandemic (Arpino et al., 2020a, 2022; Dykstra et al., 2014). However, it is possible that only some children (e.g., the more educated) may be more careful with their parents and either get tested or have low risk themselves, depending on their gender, age, marital status, or employment situation. Similarly, the impact of intergenerational coresidence on COVID-19 might depend on the socioeconomic condition of older adults, as additional analyses have shown (Supplementary Tables A13 and A14). Our study strongly recommends further investigation into the possible heterogeneity in the effects of intergenerational relationships on COVID-19 outcomes according to both adult generations' sociodemographic and socioeconomic characteristics.

Because the ICH presumes that intergenerational contacts are at the root of a fast and important transmission mode of the virus among the older population (Bayer & Kuhn, 2020; Dowd, Andriano, et al., 2020; Esteve et al., 2020; Stokes & Patterson, 2020), we assumed that exposure to COVID-19 from children was more strongly associated with COVID-19 infection among parents than exposure to COVID-19 through other family members, friends, neighbors, and acquaintances (Hypothesis 4). Our results showed that for both men and women, spousal exposure severity influenced the risk of COVID-19 more than exposure to COVID-19 through any other person in the social network. COVID-19 exposure severity from children affected men in the same way as exposure severity through all other persons with the exception of spouses. For women, the effect of children's exposure severity was stronger than that of other relatives living outside the household and other persons (i.e., neighbors, friends, colleagues, caregivers, and others). This evidence is consistent with social contagion and support mechanisms between

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

spouses identified in pre-COVID studies (for a review, see Umberson and Thomeer, 2020). Similarly, these results are in line with those of a recent study indicating a stronger role for spouses compared to children in influencing COVID-19 precautionary behaviors (e.g., physical distancing, mask wearing, or frequent hand washing) and vaccination (Arpino et al., 2022).

Finally, our results showed that those who provided care for grandchildren had a higher risk of COVID-19 than those who did not have grandchildren and those who did not provide care for grandchildren (Hypothesis 5). This result is in line with those of previous ecological analyses that showed a positive association between grandchild care provision and COVID-19 fatality rates (Arpino et al., 2020a).

Some limitations in our study should be acknowledged. First, our data might not fully solve issues of reverse causality. For example, a person's preexisting COVID-19 diagnosis can likely reduce the propensity to have face-to-face contact with their children who live outside the home. Likewise, some grandparents may have reduced the amount of grandchild care they provided during the pandemic to avoid the risk of infection. As our data did not allow us to investigate intraindividual changes in the provision of grandparental childcare, future studies must investigate this issue more in depth. Second, this study did not link microdata estimations to macrodata on countries' government responses to COVID-19. With the administration of further waves of SHARE, the potential for combining micro and macro determinants of COVID-19 will increase substantially. This will allow us to further investigate how multiple dimensions of intergenerational relationships are of different importance for the health of women and men living in different institutional contexts. Related to this point, it is important to note that when SHARE Corona Survey 1 (SCS1) data were collected (June–August 2020), COVID-19 vaccines had not yet been developed or distributed. Previous research indicates that having close kin is overall positively associated with older individuals' likelihood of being vaccinated or other preventive self-care practices during the COVID-19 pandemic (e.g., physical distancing, mask wearing, and frequent hand washing; Arpino et al., 2022). Future studies should investigate whether vaccine uptake or other precautionary behaviors could be a possible mechanism that explains the links between the availability of close kin (i.e., partners and children) and older adults' COVID-19 outcomes. Third, there may be an underestimation of the risk of infection among those who coresided with their adult children if their response rate to the CATI interview was low. However, methodological quality controls indicated that the individual response rates were satisfactory (Bergmann & Börsch-Supan, 2022; Schuller et al., 2021).

Despite these limitations, this study extends the previous literature in several ways. First, we provided new empirical evidence on the links between intergenerational relationships and COVID-19 outcomes at older ages. To do so, we analyzed individual-level data from large cross-nationally representative samples of middle-aged and older persons living in 27 European countries collected during the first and second waves of the COVID-19 pandemic in Europe (Bergmann & Börsch-Supan, 2022; Scherpenzeel et al., 2020). Second, this study examined how the risk of COVID-19 may vary according to the different dimensions of intergenerational ties considered. Unlike previous studies, we accounted for several dimensions of intergenerational relationships, showing how each of them influences the COVID-19 risk of older adults in a different way. Third, our study shows how these influences differ both according to the stage of the pandemic (first and second waves of COVID-19 in Europe) and according to the gender of the respondent. We anticipate our study to be a starting point for more in-depth studies on how intergenerational relationships affect COVID-19 outcomes globally, as well as how different types of social relationships can have different consequences in different stages of a (health) crisis.

In addition to helping inform public health policy decisions about how to best reduce the spread of COVID-19, our findings can be utilized to fight future pandemics and health crises. Highly interconnected globalized economies make pandemics a rapidly growing risk. The COVID-19 pandemic was not a rare event but a global disruption that is very likely to happen again in the future. Therefore, it is important to understand how COVID-19 is transmitted and how it affects families. Moreover, the current study illustrates how families work in the case of unforeseen events and the key role of gender. Because of the kin-keeping role of women and their greater embeddedness in networks of support, they are more likely to have contact with other people. However, this also means they are more likely to benefit from these interactions in terms of protection from COVID-19.

In conclusion, our findings underscore the dual role of intergenerational relationships in the risk of COVID-19. While intergenerational relationships might protect against the risk of COVID-19, certain forms of intergenerational solidarity, such as the provision of grandchild care, are linked to an increased risk of COVID-19. Policy interventions specifically aimed at rarefying intergenerational relations within families may produce small and inefficient results. However, we think that there is room for implementing policies that can increase family safety. The protective influence of more frequent contact with children might indicate the importance of practical help—especially for women who have family responsibilities and undertake household tasks such as shopping for groceries or other necessities—and emotional support. Our study suggests implementing policies to provide this kind of support, as they are often lacking in some European contexts (Carretero et al., 2012), and access to formal services is strongly socioeconomically stratified in familistic countries, such as Italy (Albertini & Pavolini, 2017). Our findings also suggest that

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

grandchildren might be a vector of contagion and underscore the need for support for families with young children, who normally count on grandparents for regular or occasional help. This may especially protect grandfathers who are probably less attentive to protective behaviors against COVID-19 (Bwire, 2020). These and other aspects should be carefully considered when developing strategies and recommendations to protect older adults from the risk of COVID-19.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

Funding

This work was supported by the Belgian National Fund for Scientific Research—"Fonds National de la Recherche Scientifique" (Grant number H.P066.20).

Conflict of Interest

None declared.

Acknowledgments

This study was carried out as part of the project "Kin and non-kin ties during the COVID-19 pandemic: contagion or protection for older adults?" The project is funded by the Belgian National Fund for Scientific Research (NFSR) "Exceptional Research Projects". The authors want to thank three anonymous reviewers and colleagues at the Center for Demographic Research (DEMO) of the University of Louvain (UCLouvain) for their constructive remarks on earlier versions of this article. Previous versions of the paper have been presented at the European Consortium for Sociological Research (ECSR), Collegio Carlo Alberto, and NASP joint Spring School on "The Impact of Covid-19 on Social Inequality" (March 22–26, 2021) and at the Population Association of America (PAA) 2022 Annual Meeting (April 6–9, 2022). Replication files are available at the corresponding author's website: https://damianoucchedu.com/. This paper uses data from the SHARE Wave 8 COVID-19 Survey 1 (DOI: 10.6103/SHARE.w8ca.800) and SHARE Wave 9 COVID-19 Survey 2 (DOI: 10.6103/SHARE.w9ca.800), see Scherpenzeel et al. (2020) for methodological details. In addition, this paper uses data from the regular SHARE Waves 1, 2, 4, 5, 6, 7, and 8 (DOIs: 10.6103/SHARE.w1.800, 10.6103/SHARE.w2.800, 10.6103/SHARE.w3.800, 10.6103/SHARE.w4.800, 10.6103/SHARE.w5.800, 10.6103/SHARE.w6.800, 10.6103/SHARE.w7.800, and 10.6103/SHARE.w8.800), see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193,COMPARE:CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA No. 211909, SHARE-LEAP: GA No. 227822, SHARE M4: GA No. 261982) and Horizon 2020 (SHARE-DEV3: GA No. 676536, SERISS: GA No. 654221) and by DG Employment, Social Affairs & Inclusion. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C), and from various national funding sources is gratefully acknowledged (see www.share-project.org).

Author Contributions

D. Uccheddu and E. L. Rizzi conceptualized and designed the study, developed the analytical strategy, reviewed and revised the manuscript, and approved the final manuscript as submitted. D. Uccheddu carried out all analyses and drafted the initial manuscript.

References

Ahrenfeldt, L. J., Otavova, M., Christensen, K., & Lindahl-Jacobsen, R. (2021). Sex and age differences in COVID-19 mortality in Europe. *Wiener Klinische Wochenschrift*, **133**(7), 393–398. doi:10.1007/s00508-020-01793-9

Albertini, M., & Pavolini, E. (2017). Unequal inequalities: The stratification of the use of formal care among older Europeans. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **72**(3), 510–521. doi:10.1093/geronb/gbv038

Anand, P., Allen, H. L., Ferrer, R. L., Gold, N., Gonzales Martinez, R. M., Kontopantelis, E., Krause, M., & Vergunst, F. (2022). Work-related and personal predictors of COVID-19 transmission: Evidence from the UK and USA. *Journal of Epidemiology and Community Health*, **76**(2), 152–157. doi:10.1136/jech-2020-215208

Andrade, F. C. D., Quashie, N. T., & Schwartzman, L. F. (2022). Coresidence increases the risk of testing positive for COVID-19 among older Brazilians. *BMC Geriatrics*, **22**(1), 105. doi:10.1186/s12877-022-02800-6

Arpino, B., Bordone, V., & Gessa, G. D. (2022). *Close kin influence COVID-19 precautionary behaviors and vaccine acceptance of older individuals* [Preprint]. In Review. doi:10.21203/rs.3.rs-1699988/v1

Arpino, B., Bordone, V., & Pasqualini, M. (2020a). No clear association emerges between intergenerational relationships and COVID-19 fatality rates from macro-level analyses. *Proceedings of the National Academy of Sciences of the United States of America*, **117**(32), 19116–19121. doi:10.1073/pnas.2008581117

Arpino, B., Bordone, V., & Pasqualini, M. (2020b). Reply to Dowd *et al.*: Dangerous to overemphasize the importance of specific COVID-19 risk factors based on (unadjusted) macro-level

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

analyses. *Proceedings of the National Academy of Sciences of the United States of America*, **117**(42), 259777–25978. doi:10.1073/pnas.2017464117

Basellini, U., & Camarda, C. G. (2022). Explaining regional differences in mortality during the first wave of Covid-19 in Italy. *Population Studies*, **76**(1), 99–118. doi:10.1080/00324728.2021.1984551

Bayer, C., & Kuhn, M. (2020). *Intergenerational Ties and Case Fatality Rates: A Cross-Country Analysis* (SSRN Scholarly Paper ID 3573284). Social Science Research Network. https://papers.ssrn.com/abstract=3573284

Bergmann, M., & Börsch-Supan, A. H. (2022). *SHARE WAVE 8 Methodology: Collecting Cross-National Survey Data in Times of COVID-19*. MEA, Max Planck Institute for Social Law and Social Policy. http://share-project.se/home0/news/article/the-share-wave-8-methodology-volume-is-out.html

Börsch-Supan, A. H., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., & Zuber, S. (2013). Data resource profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology*, **42**(4), 992–1001. doi:10.1093/ije/dyt088

Brandén, M., Aradhya, S., Kolk, M., Härkönen, J., Drefahl, S., Malmberg, B., Rostila, M., Cederström, A., Andersson, G., & Mussino, E. (2020). Residential context and COVID-19 mortality among adults aged 70 years and older in Stockholm: A population-based, observational study using individual-level data. *The Lancet Healthy Longevity*, **1**(2), e80–e88. doi:10.1016/s2666-7568(20)30016-7

Brown, L. H., & DeRycke, S. B. (2010). The kinkeeping connection: Continuity, crisis and consensus. *Journal of Intergenerational Relationships*, **8**(4), 338–353. doi:10.1080/15350770.2010.520616

Bwire, G. M. (2020). Coronavirus: Why men are more vulnerable to Covid-19 than women? *SN Comprehensive Clinical Medicine*, **2**(7), 874–876. doi:10.1007/s42399-020-00341-w

Carretero, S., Stewart, J., Centeno, C., Barbabella, F., Schmidt, A., Lamontagne-Godwin, F., & Lamura, G. (2012). Can technology-based services support long-term care challenges in home care. *Analysis of Evidence from Social Innovation Good Practices across the EU CARICT Project Summary Report*, **15**, 113. doi:10.2791/43024

Connidis, I. A., & Barnett, A. E. (2018). *Family ties and aging*. SAGE Publications.

Dowd, J. B., Andriano, L., Brazel, D. M., Rotondi, V., Block, P., Ding, X., Liu, Y., & Mills, M. C. (2020). Demographic science aids in understanding the spread and fatality rates of COVID-19. *Proceedings of the National Academy of Sciences of the United States of America*, **117**(18), 9696–9698. doi:10.1073/pnas.2004911117

Dowd, J. B., Block, P., Rotondi, V., & Mills, M. C. (2020). Dangerous to claim "no clear association" between intergenerational relationships and COVID-19. *Proceedings of the National Academy of Sciences of the United States of America*, **117**(42), 25975–25976. doi:10.1073/pnas.2016831117

Dykstra, P. A., van den Broek, M. P. B., Muresan, C., Haragus, M., Haragus, P.-T., Abramowska-Kmon, A., & Kotowska, I. E. (2014). State-of-the-art report: Intergenerational linkages in families. http://hdl.handle.net/1765/503

Ebrahimi, O. V., Hoffart, A., & Johnson, S. U. (2021). Viral mitigation and the COVID-19 pandemic: Factors associated with adherence to social distancing protocols and hygienic behaviour. *Psychology & Health*, **0**(0), 1–24. doi:10.1080/08870446.2021.1960987

Esteve, A., Permanyer, I., Boertien, D., & Vaupel, J. W. (2020). National age and coresidence patterns shape COVID-19 vulnerability. *Proceedings of the National Academy of Sciences of the United States of America*, **117**(28), 16118–16120. doi:10.1073/pnas.2008764117

Fenoll, A. A., & Grossbard, S. (2020). Intergenerational residence patterns and COVID-19 fatalities in the EU and the US. *Economics & Human Biology*, **39**, 100934. doi:10.1016/j.ehb.2020.100934

Flagg, L. A., Sen, B., Kilgore, M., & Locher, J. L. (2014). The influence of gender, age, education and household size on meal preparation and food shopping responsibilities. *Public Health Nutrition*, **17**(9), 2061–2070. doi:10.1017/S1368980013002267

Fraser, T., & Aldrich, D. P. (2021). The dual effect of social ties on COVID-19 spread in Japan. *Scientific Reports*, **11**(1), Article 1. doi:10.1038/s41598-021-81001-4

Gebhard, C., Regitz-Zagrosek, V., Neuhauser, H. K., Morgan, R., & Klein, S. L. (2020). Impact of sex and gender on COVID-19 outcomes in Europe. *Biology of Sex Differences*, **11**(1), 29. doi:10.1186/s13293-020-00304-9

Global Health 5050. (2022). *The COVID-19 Sex-Disaggregated Data Tracker*. https://globalhealth5050.org/the-sex-gender-and-covid-19-project/

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., … Cao, B. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*, **395**(10223), 497–506. doi:10.1016/s0140-6736(20)30183-5

Lakbar, I., Luque-Paz, D., Mege, J.-L., Einav, S., & Leone, M. (2020). COVID-19 gender susceptibility and outcomes: A systematic review. *PLoS One*, **15**(11), e0241827. doi:10.1371/journal.pone.0241827

Leap, B., Stalp, M. C., & Kelly, K. (2022). Reorganizations of gendered labor during the COVID-19 pandemic: A review and suggestions for further research. *Sociological Inquiry*, **93**(1), 179–200. doi:10.1111/soin.12488

Leung, N. H. L. (2021). Transmissibility and transmission of respiratory viruses. *Nature Reviews Microbiology*, **19**(8), 528–545. doi:10.1038/s41579-021-00535-6

Li, W., Zhang, B., Lu, J., Liu, S., Chang, Z., Peng, C., Liu, X., Zhang, P., Ling, Y., Tao, K., & Chen, J. (2020). Characteristics of household transmission of COVID-19. *Clinical Infectious Diseases*, **71**(8), 1943–1946. doi:10.1093/cid/ciaa450

Liotta, G., Marazzi, M. C., Orlando, S., & Palombi, L. (2020). Is social connectedness a risk factor for the spreading of COVID-19 among older adults? The Italian paradox. *PLoS One*, **15**(5), e0233329. doi:10.1371/journal.pone.0233329

Litwin, H., & Levinsky, M. (2021). Network-exposure severity and self-protective behaviors: The case of COVID-19. *Innovation in Aging*, **5**(2), igab015. doi:10.1093/geroni/igab015

Lubben, J., Blozik, E., Gillmann, G., Iliffe, S., von Renteln Kruse, W., Beck, J. C., & Stuck, A. E. (2006). Performance of an abbreviated version of the Lubben social network scale among three

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023

European community-dwelling older adult populations. *The Gerontologist*, **46**(4), 503–513. doi:10.1093/geront/46.4.503

Mogi, R., & Spijker, J. (2021). The influence of social and economic ties to the spread of COVID-19 in Europe. *Journal of Population Research*, **39**(4), 495–511. doi:10.1007/s12546-021-09257-1

Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do, and what we can do about it. *European Sociological Review*, **26**(1), 67–82. doi:10.1093/esr/jcp006

Peeri, N. C., Shrestha, N., Rahman, M. S., Zaki, R., Tan, Z., Bibi, S., Baghbanzadeh, M., Aghamohammadi, N., Zhang, W., & Haque, U. (2020). The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: What lessons have we learned? *International Journal of Epidemiology*, **49**(3), 717–726. doi:10.1093/ije/dyaa033

Prem, K., Liu, Y., Russell, T. W., Kucharski, A. J., Eggo, R. M., Davies, N., Flasche, S., Clifford, S., Pearson, C. A. B., Munday, J. D., Abbott, S., Gibbs, H., Rosello, A., Quilty, B. J., Jombart, T., Sun, F., Diamond, C., Gimma, A., van Zandvoort, K., & Klepac, P. (2020). The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: A modelling study. *The Lancet Public Health*, **5**(5), e261–e270. doi:10.1016/S2468-2667(20)30073-6

Sage, L., Albertini, M., & Scherer, S. (2021). The spreading of SARS-CoV-2: Interage contacts and networks degree distribution. *PLoS One*, **16**(8), e0256036. doi:10.1371/journal.pone.0256036

Scherpenzeel, A., Axt, K., Bergmann, M., Douhou, S., Oepen, A., Sand, G., Schuller, K., Stuck, S., Wagner, M., & Börsch-Supan, A. H. (2020). Collecting survey data among the 50+ population during the COVID-19 outbreak: The Survey of Health, Ageing and Retirement in Europe (SHARE). *Survey Research Methods*, **14**(2), 217–221. doi:10.18148/SRM/2020.V14I2.7738

Schuller, D. K., Lasson, S., Hannemann, V., & Börsch-Supan, A. H. (2021). *SHARE Compliance Profiles—Wave 8* (p. 12). MEA, Max Planck Institute for Social Law and Social Policy.

Sobotka, T., Brzozowska, Z., Muttarak, R., Zeman, K., & Lego, V. di. (2020). *Age, gender and COVID-19 infections* (p. 2020.05.24.20111765). medRxiv. doi:10.1101/2020.05.24.20111765

Stokes, J. E., & Patterson, S. E. (2020). Intergenerational relationships, family caregiving policy, and COVID-19 in the United States. *Journal of Aging & Social Policy*, **32**(4–5), 416–424. doi:10.1080/08959420.2020.1770031

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, **52**(2), 145–161. doi:10.1177/0022146510395592

Thomeer, M. B., Yahirun, J., & Colón-López, A. (2020). How families matter for health inequality during the COVID-19 pandemic. *Journal of Family Theory & Review*, **12**(4), 448–463. doi:10.1111/jftr.12398

Umberson, D., Pudrovska, T., & Reczek, C. (2010). Parenthood, childlessness, and well-being: A life course perspective. *Journal of Marriage and the Family*, **72**(3), 612–629. doi:10.1111/j.1741-3737.2010.00721.x

Umberson, D., & Thomeer, M. B. (2020). Family matters: Research on family ties and health, 2010 to 2020. *Journal of Marriage and Family*, **82**(1), 404–419. doi:10.1111/jomf.12640

Vergauwen, J., Delaruelle, K., Dykstra, P. A., Bracke, P., & Mortelmans, D. (2022). The COVID-19 pandemic and changes in the level of contact between older parents and their non-coresident children: A European study. *Journal of Family Research*, **34**(1), 512–537. doi:10.20377/jfr-695

Yan, X., Qu, T., Sperber, N., Lu, J., Fan, M., & Cornwell, B. (2021). Tied infections: How social connectedness to other COVID-19 patients influences illness severity. *American Behavioral Scientist*, **65**(14), 1901–1928. doi:10.1177/00027642211003138

Zhang, J., & Centola, D. (2019). Social networks and health: New developments in diffusion, online and offline. *Annual Review of Sociology*, **45**(1), 91–109. doi:10.1146/annurev-soc-073117-041421

Downloaded from https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbac196/6948198 by guest on 05 March 2023